### Diagnosis & Treatment of PCOS

#### Diagnosis
- Patients must have two of the following:
  1. Oligo- or anovulation
  2. Hyperandrogenism (clinical or biochemical)
  3. Polycystic ovaries identified on ultrasound (either 12 or more follicles or increased ovarian volume >10cc)
- Risk factors: family history
- Other symptoms: subfertility, oily skin, thinning hair or alopecia
- Clinical features: oligomenorrhoea, anovulatory infertility, hirsutism, acne, male pattern balding, depression, mood changes. Acanthosis nigricans may be seen in profoundly insulin resistant obese PCOS patients. 40-50% of patients have a raised BMI.

#### Follow Up
Where simple measures such as weight loss and hormonal therapy are effective at reducing symptoms, this can be managed in primary care. Anovulation must be reviewed in a gynaecology clinic regularly until regulated.

Infertility patients will be reviewed by the fertility specialists in secondary care.

#### Treatment
- Conservative management if the patient does not have symptoms
- Weight loss – increase physical activity and refer to dietitian
- Treat oligo-/amenorrhoea: combined oral contraceptive pills, or cyclical progesterone (10-14 days every three months). Induce a withdrawal bleed every three to four months to avoid endometrial hyperplasia developing in the long-term
- Consider metformin to regulate menstruation if contraception is not required
- Treatment of hirsutism: depilation, eflornithine, electrolysis, laser. Use of hormonal contraception may help by reducing circulating androgens

#### Complications of PCOS
- Short-term
  - Obesity
  - Infertility
  - Irregular menses
  - Abnormal lipid levels
  - Hirsutism/acne/androgenic alopecia
  - Glucose intolerance/acanthosis nigricans
- Long-term
  - Diabetes
  - Endometrial cancer (related to amenorrhoea and endometrial hyperplasia)
  - Cardiovascular disease
  - Dyslipidaemia
  - Obstructive sleep apnoea
  - Risks associated with pregnancy
  - Increased risk of miscarriage
  - Gestational diabetes
  - Pregnancy-induced hypertension
  - Pre-eclampsia

#### Differential Diagnosis
- Hypothyroidism
- Congenital adrenal hyperplasia (late-onset)
- In patients with menstrual disturbances and signs of hyperandrogenism:
  - Hyperprolactinaemia
  - Idiopathic/familial hirsutism
  - Masculinising tumours of the adrenal gland or ovary (rapid onset of signs of virilisation)
- Cushing’s Syndrome
- Anabolic steroid use

#### Investigations
- Increased androgens (testosterone and androstenedione). In cases where testosterone >5nmol/l, exclude other causes such as androgen-secreting tumours
- Increasing lutetising hormone (LH). In PCOS, an elevated LH:FSH ratio may be seen. This is best measured on day 1-5 of the cycle, if possible
- Normal FSH
- Reduced sex hormone-binding globulin (SHBG)
- Normal (mid-follicular range) oestradiol in anovulatory women; reduced progesterone
- Abnormal thyroid function may be seen
- Impaired glucose tolerance in obese patients
- Transvaginal ultrasound to assess the ovarian morphology and endometrial thickness. This is important in women with oligomenorrhoea, as a thickened endometrium may suggest hyperplasia and require an endometrial biopsy or hysteroscopy

#### PCOS-Related Infertility
- BMI <30: clomiphene citrate (licensed for six month use). Dose 50-100mg for days 2-6 of a natural or induced bleed. However, there is a 10% risk of multiple pregnancy. Ideally, patients should be monitored by ultrasound guidance to ensure ovulation has occurred.
- Optimise weight prior to clomiphene therapy to increase the likelihood of ovulation
- Gonadotrophin therapy (medical): start with low dose therapy (50-75IU daily subcutaneous)

#### Complications
- IVF: this is not the first line treatment for PCOS, while patients may develop more follicles and eggs, there is often a lower fertilisation rate and a higher risk of ovarian hyperstimulation syndrome

#### References

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